Expanding Virginia's Ground Water Management Area

Office of Surface and Ground Water Supply Planning

Why Consider Designation?

- To protect existing users from new or expanding withdrawals.
- To assure continued resource viability into the future.
- To manage the resource comprehensively.

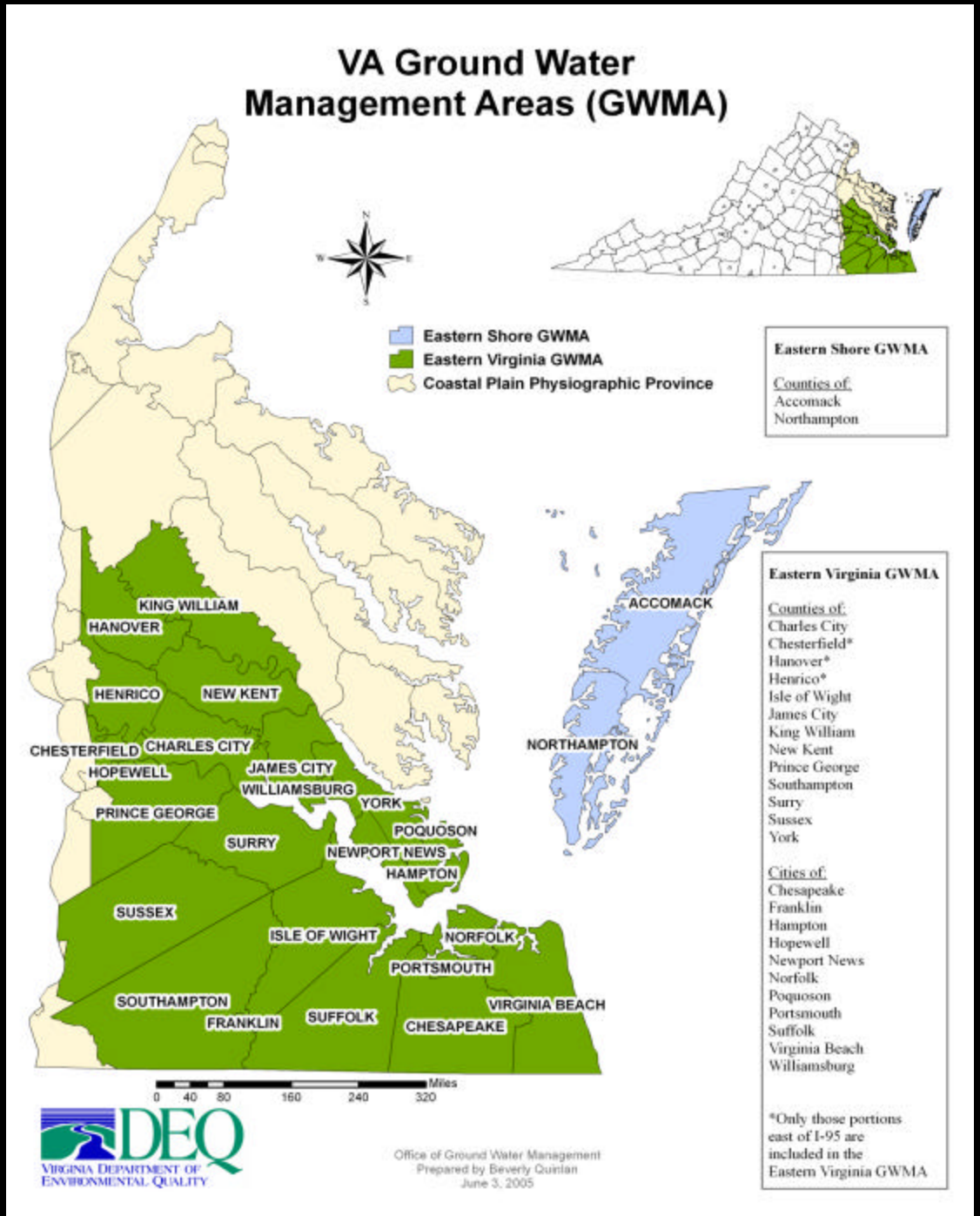
Designation changes the status quo

- Withdrawals over 300,000 gpm will need a permit.
- Technical evaluations including aquifer tests will be required (and these cost $).
- If the withdrawal impacts other user's wells within its area of impact, mitigation can be required.
- Permit requirement can be perceived as a disincentive for new growth.

Currently 2 Groundwater Management Areas:

Eastern Shore

Eastern Virginia



Where does DEQ stand?

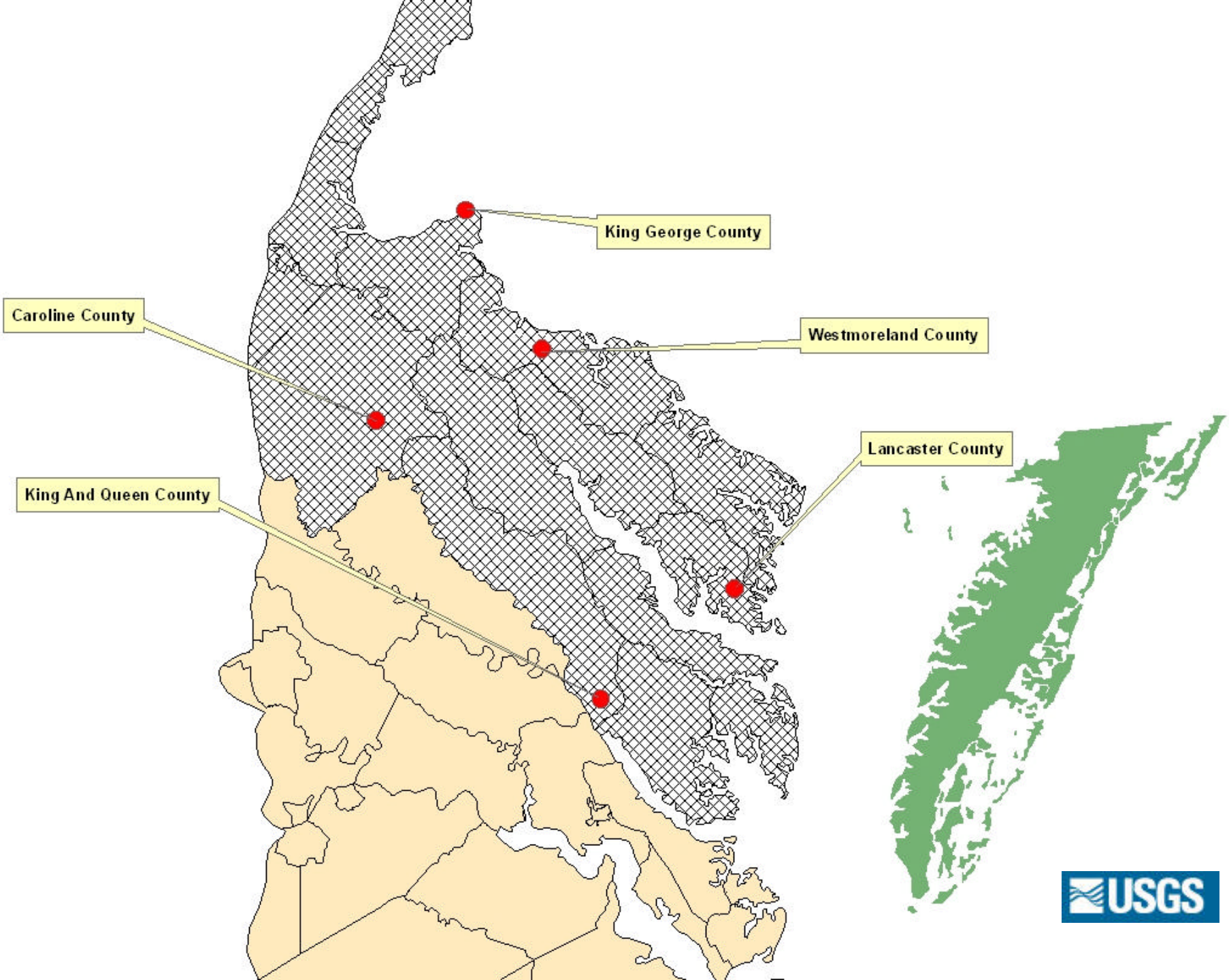
- The coastal plain aquifer system is likely best managed as one coastal plain management area.
- To manage the resources comprehensively, designating earlier is likely better than waiting until later to designate.
- There is need for additional monitoring in the region to understand how the system works and to calibrate the model used to determine compliance with regulatory criteria.
- DEQ prefers to have the support of the majority of the remaining coastal plain localities.

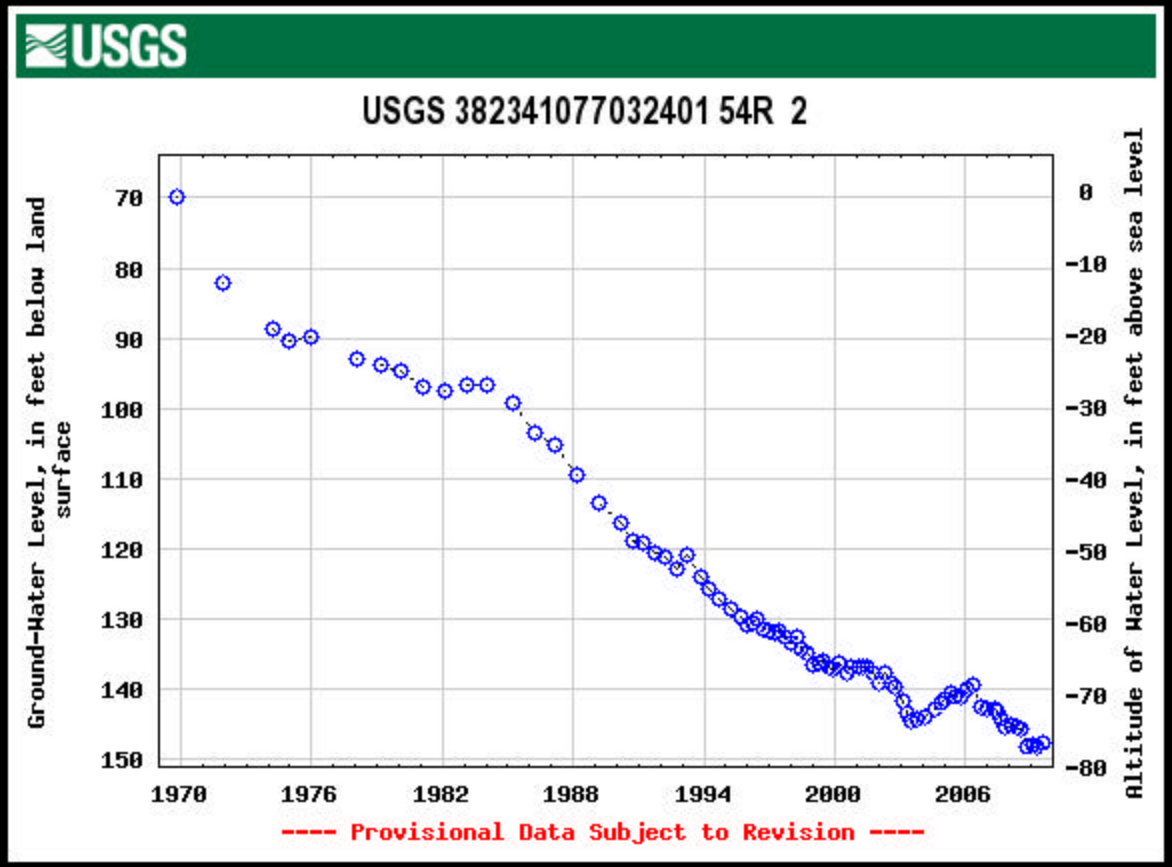
Indicators used by SWCB to designate

- Ground water levels in the area are declining or are expected to decline excessively.
- The wells of two or more ground water users within the area are interfering or may reasonably be expected to interfere substantially with one another;
- The available ground water supply has been or may be overdrawn; or
- The ground water in the area has been or may become polluted.

DECLINING WATER LEVELS

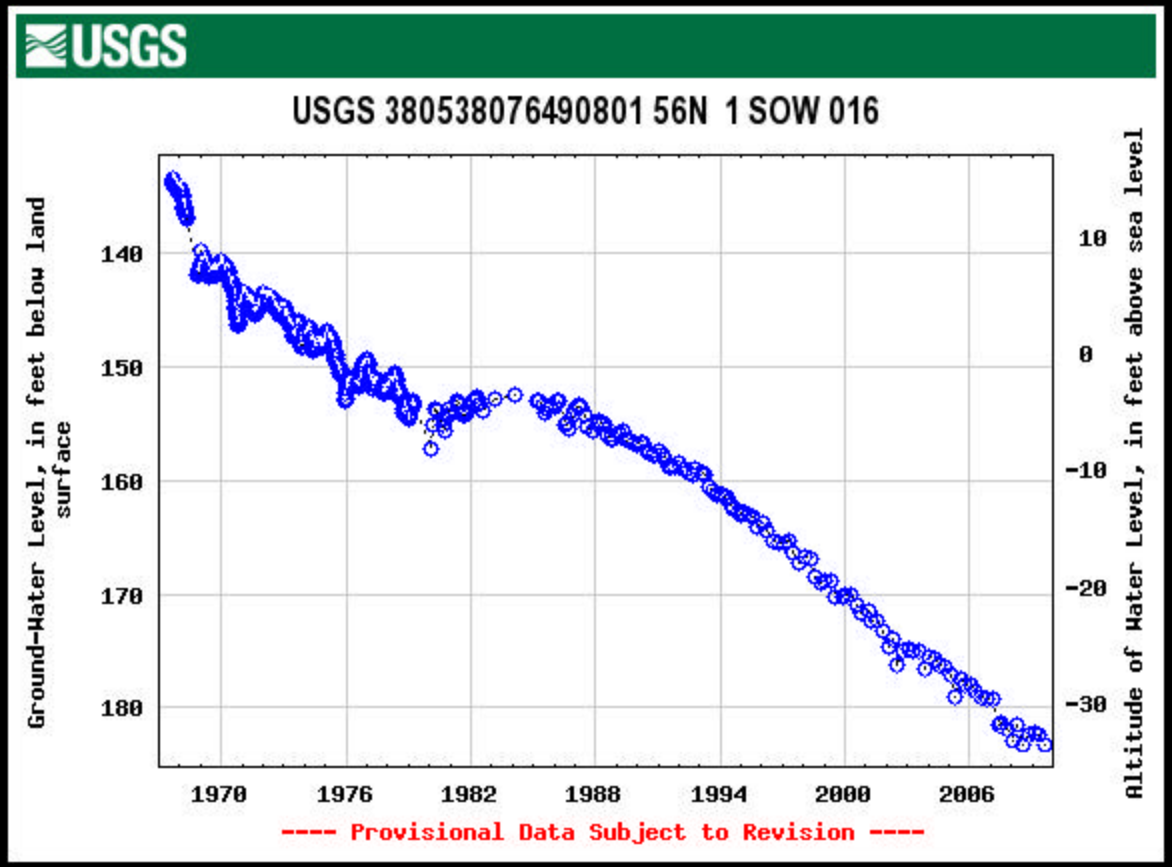
- **Northern Neck**
- **Middle Peninsula**


King George County
Caroline County
Westmoreland County
Lancaster County
King And Queen County
USGS



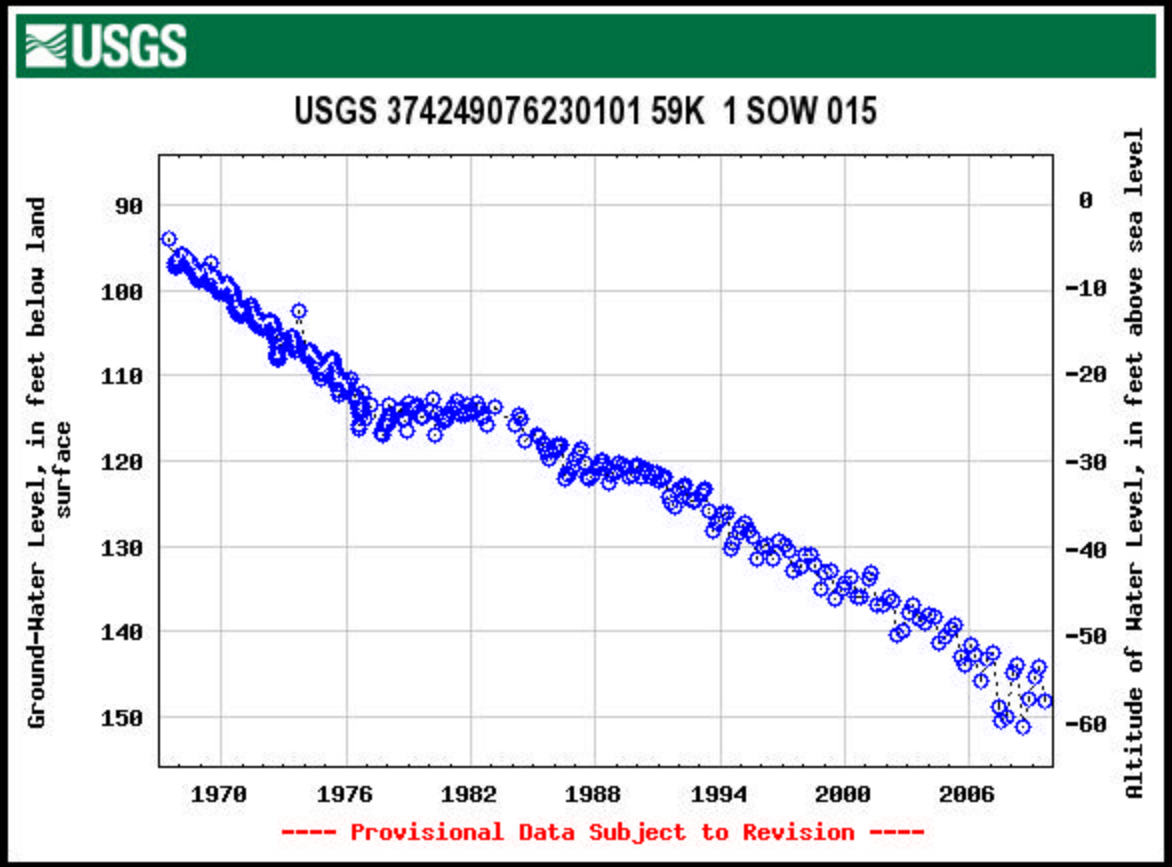
King George County, Virginia—
The depth of the well is 806 feet.
The well is completed in the Potomac aquifer.

USGS



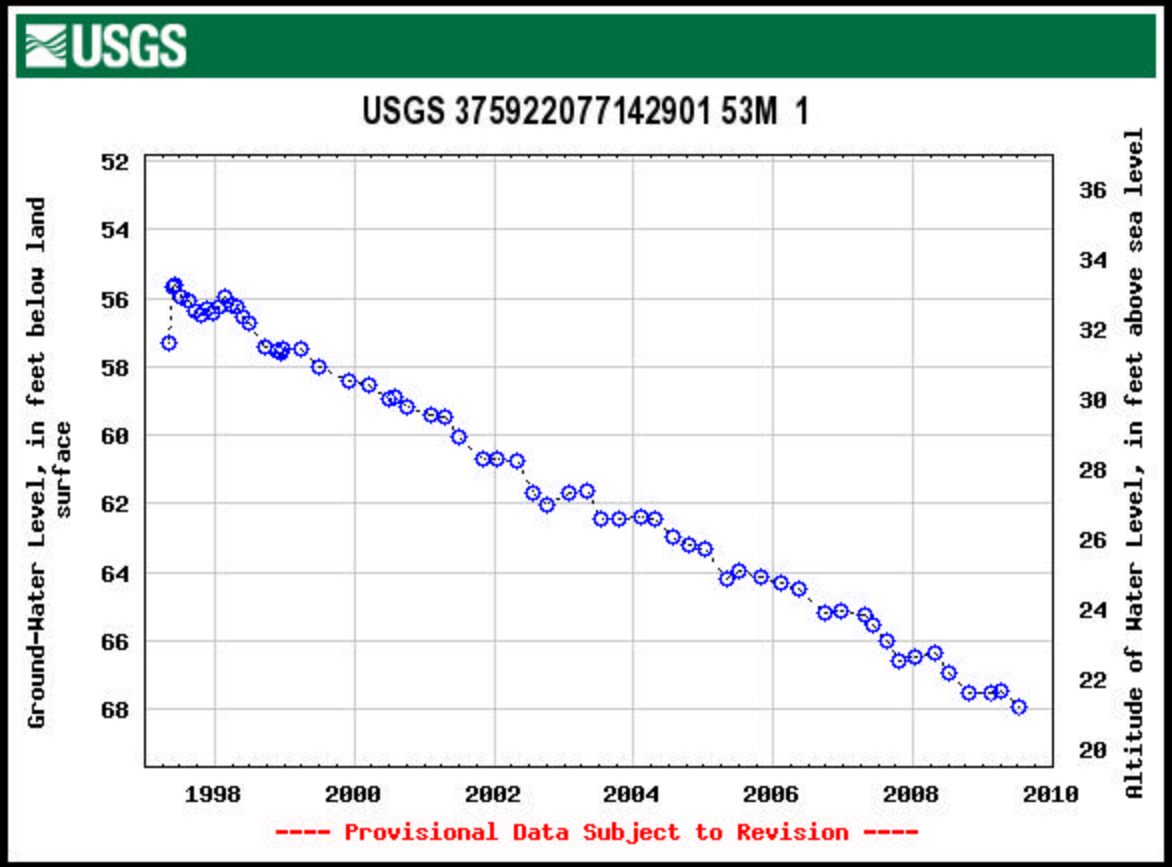
Westmoreland County, Virginia—
The depth of the well is 641 feet.
The well is completed in the Potomac aquifer.

USGS



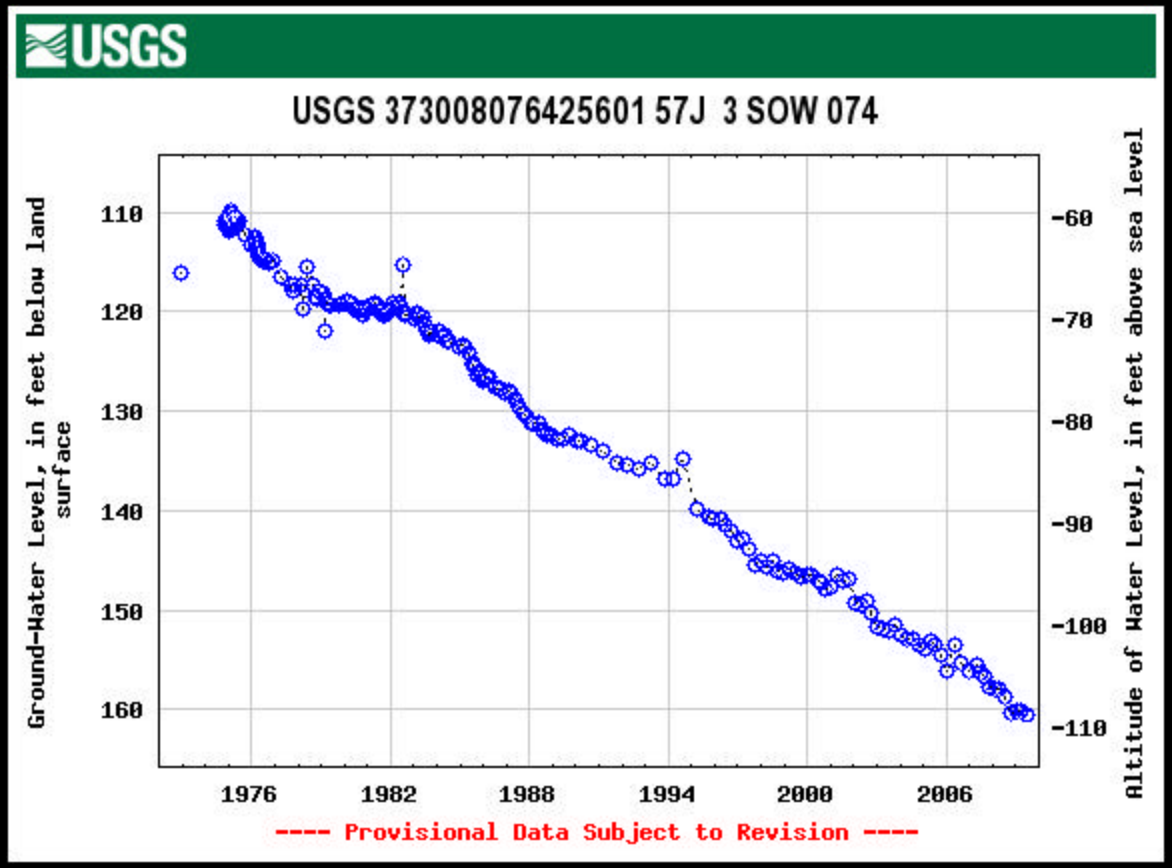
Lancaster County, Virginia—
The depth of the well is 716 feet.
The well is completed in the Potomac aquifer.

USGS



Caroline County, Virginia—
The depth of the well is 110.75 feet.
The well is completed in the Aquia aquifer.

USGS

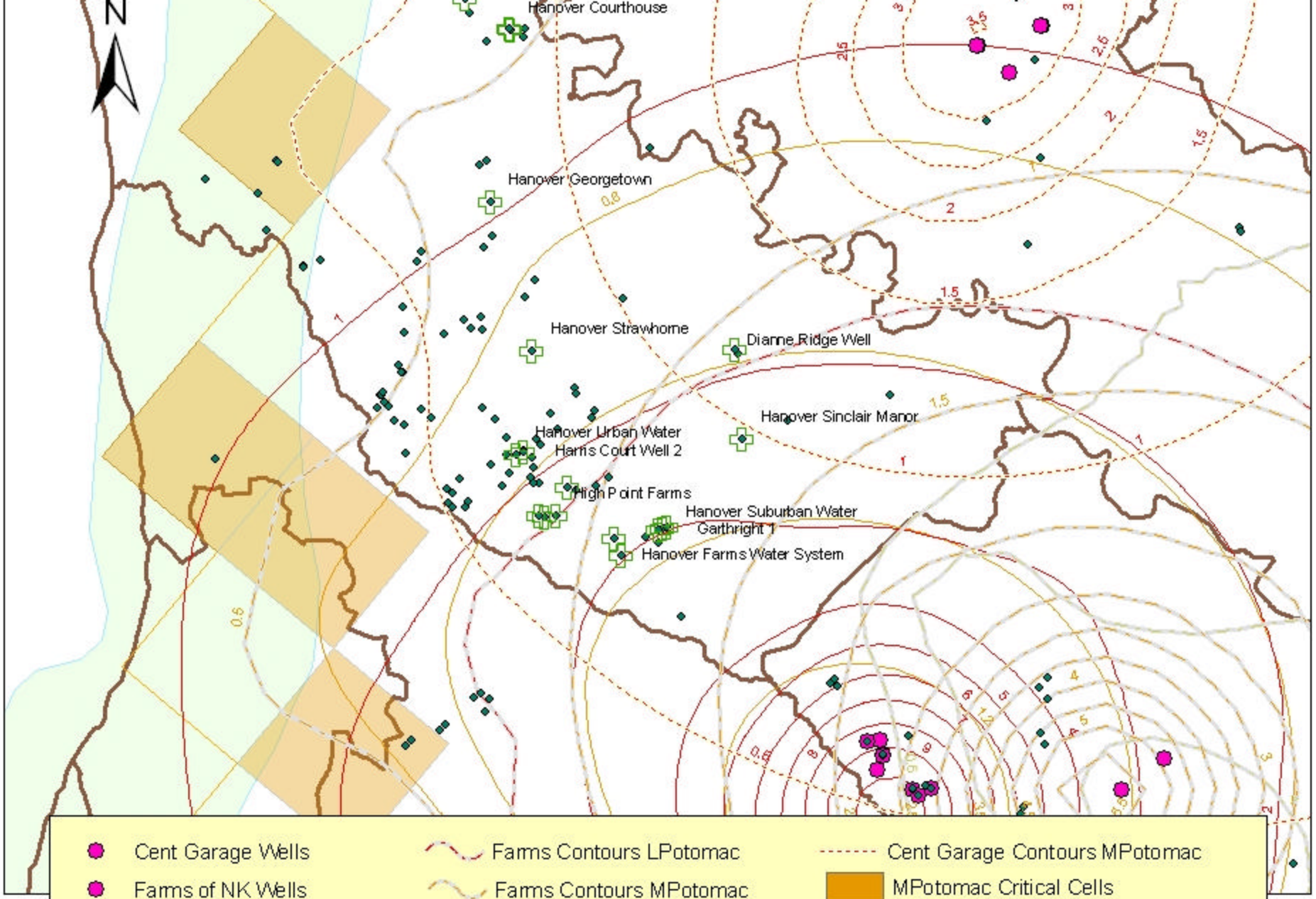


King And Queen County, Virginia—
The depth of the well is 760 feet.
The well is completed in the Potomac aquifer.

USGS

WELL INTERFERENCE

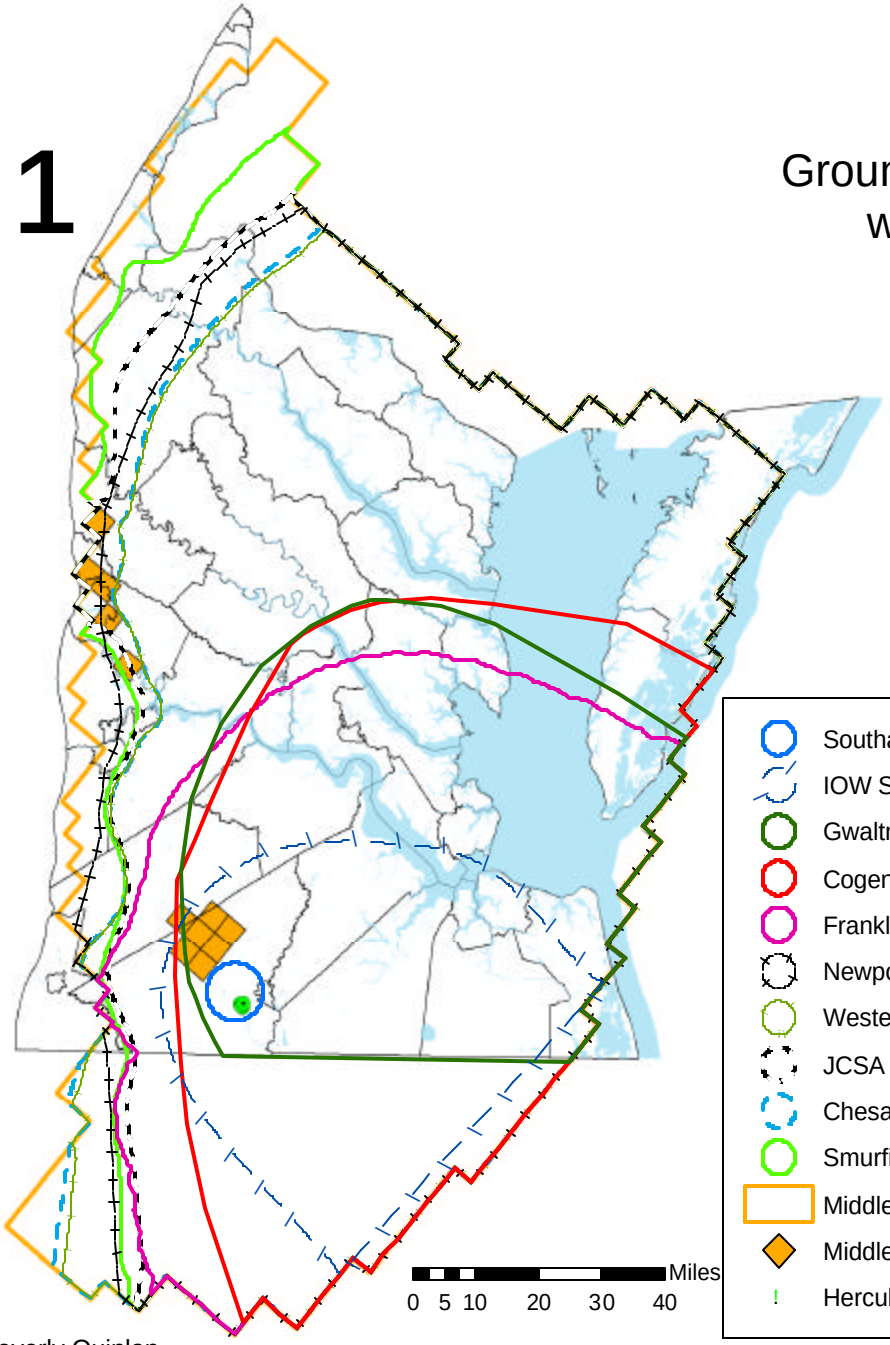
- **Northern Neck**
- **Middle Peninsula**


N
Hanover Courthouse
Hanover Georgetown
Hanover Strawhorne
Dianne Ridge Well
Hanover Sinclair Manor
Hanover Urban Water
Harris Court Well 2
High Point Farms
Hanover Suburban Water
Garthright 1
Hanover Farms Water System
Cent Garage Wells
Farms of NK Wells
NK Bottoms Bridge Wells
GWPermit Wells
Hanover County System
Farms Contours LPotomac
Farms Contours MPotomac
Farms Contours UPotomac
BB Contours LPotomac
BB Contours MPotomac
Cent Garage Contours MPotomac
MPotomac Critical Cells
MPotomac Model Boundary
FallZone

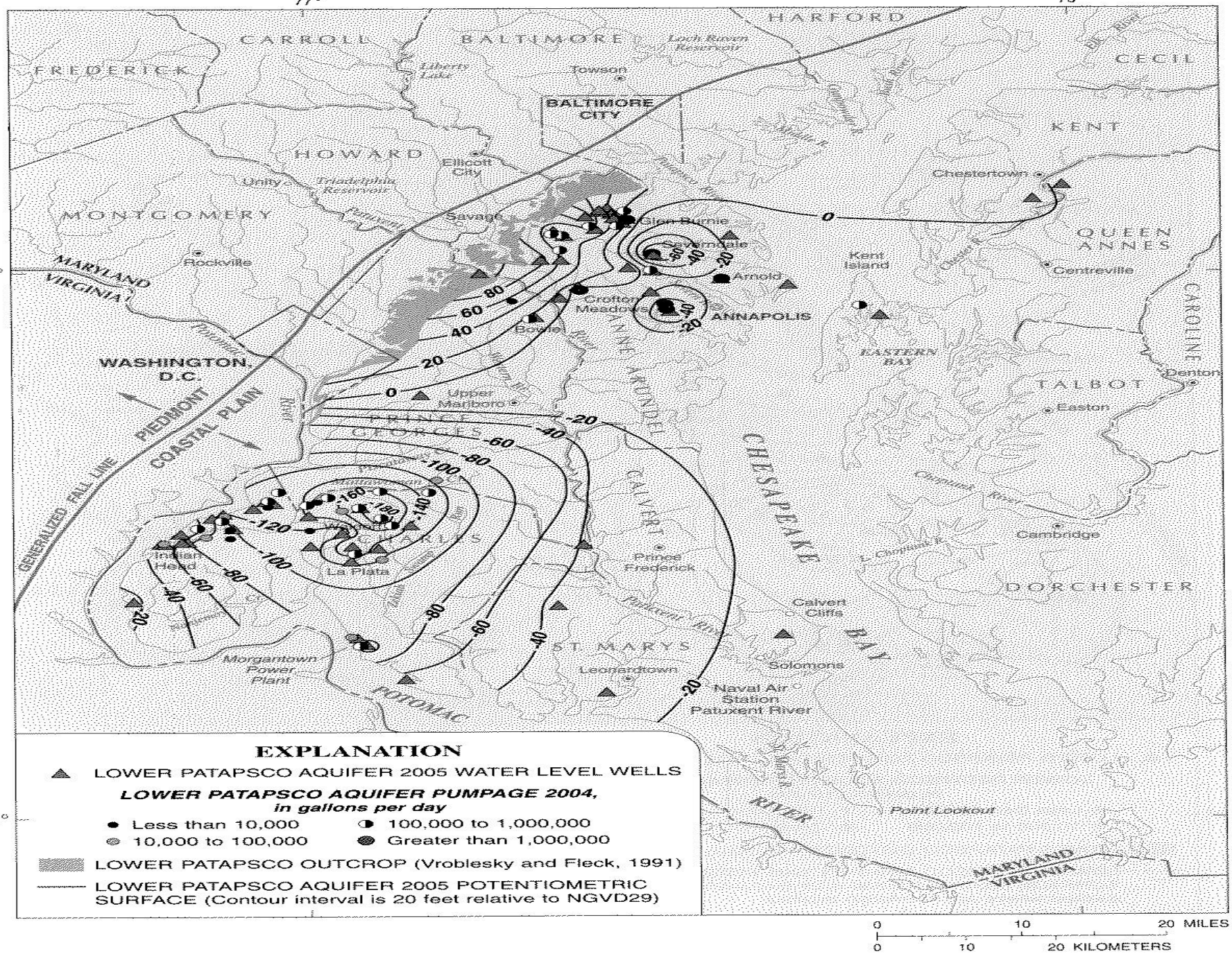
1

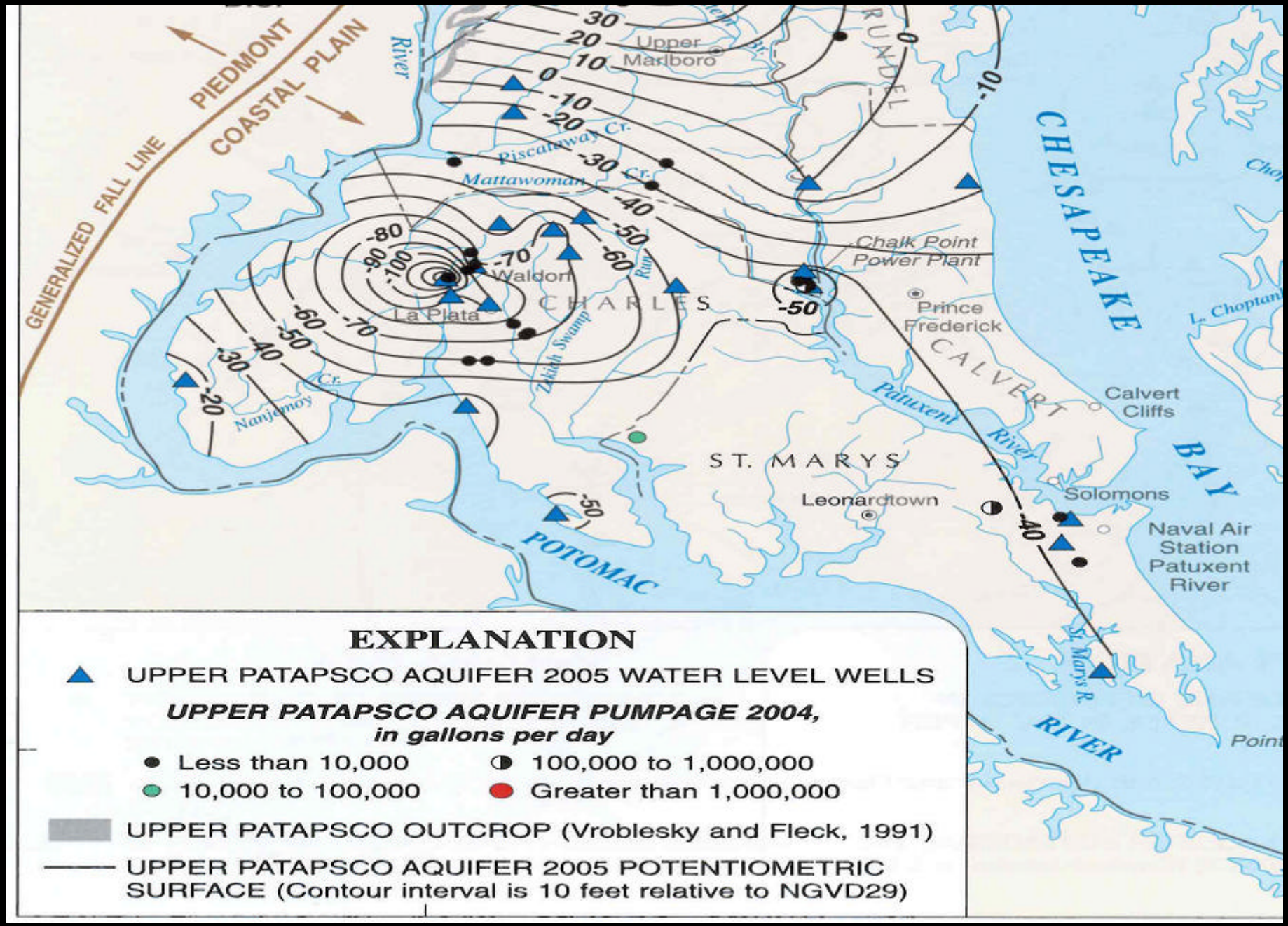
Ground Water Withdrawal Permit holders with mitigation responsibilities to Hercules Incorporated

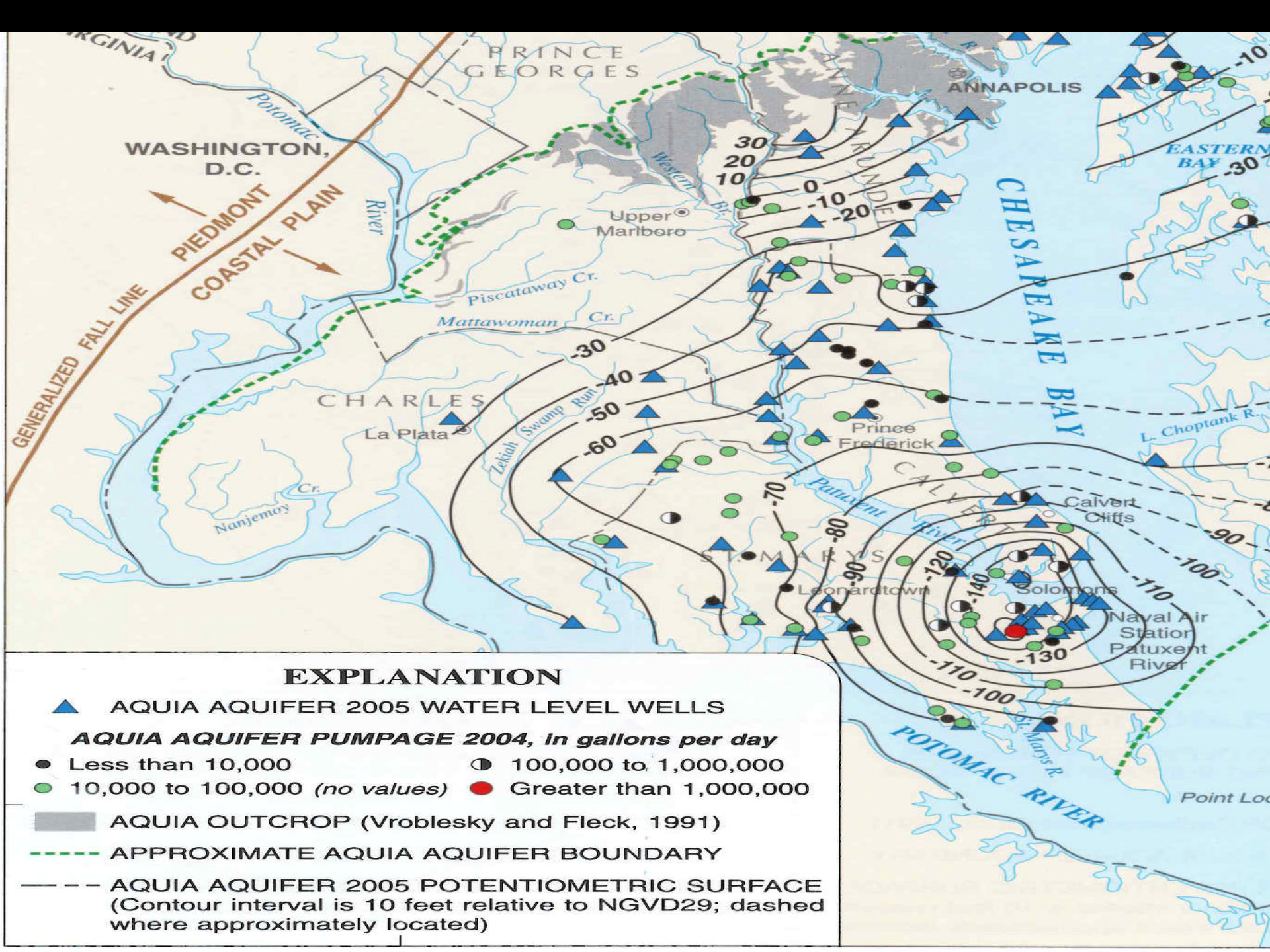
(Middle Potomac Aquifer)



- Southampton, County of - Agri Business GW0033800 (109,500,000 gal/yr)
- IOW Southern Development SD GW0042600 (357,700,000 gal/yr)
- Gwaltney of Smithfield GW0042100 (568,700,032 gal/yr)
- Cogentrix GW0036300 (949,000,000 gal/yr)
- Franklin, City of GW0042900 (1,051,200,000 gal/yr)
- Newport News, City of GW0030200 (2,555,000,064 gal/yr)
- Western Tidewater Water Authority GW0045800 (3,045,770,000 gal/yr)
- JCSA Central GW0043400 (3,267,000,000 gal/yr)
- Chesapeake, City of GW0043900 (4,015,000,000 gal/yr)
- Smurfit-Stone Container GW0005100 (8,407,200,000 gal/yr)
- Middle Potomac Aquifer Active Model Area
- Middle Potomac Aquifer Critical Cells
- Hercules Production Wells


HARFORD
CARROLL
BALTIMORE
CECIL
FREDERICK
Towson
BALTIMORE CITY
KENT
HOWARD
Ellicott City
Unity
Triadelphia Reservoir
Savage
Glen Burnie
Severndale
Chestertown
MONTGOMERY
QUEEN ANNES
Kent Island
Centreville
Rockville
MARYLAND
VIRGINIA
Arnold
Crofton
Meadows
Bowie
ANNAPOLIS
CAROLINE
WASHINGTON, D.C.
EASTERN BAY
Denton
TALBOT
Upper Marlboro
Easton
PRINCE GEORGES
ANNE ARUNDEL
PIEDMONT
COASTAL PLAIN
GENERALIZED FALL LINE
CHESAPEAKE BAY
CALVERT
Cambridge
Indian Head
La Plata
Prince Frederick
DORCHESTER
Calvert Cliffs
ST MARYS
Morgantown Power Plant
Leonardtown
Solomons
POTOMAC
Naval Air Station Patuxent River
RIVER
Point Lookout
MARYLAND
VIRGINIA
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
39°
38°
EXPLANATION
LOWER PATAPSCO AQUIFER 2005 WATER LEVEL WELLS
LOWER PATAPSCO AQUIFER PUMPAGE 2004, in gallons per day
Less than 10,000
10,000 to 100,000
100,000 to 1,000,000
Greater than 1,000,000
LOWER PATAPSCO OUTCROP (Vroblesky and Fleck, 1991)
LOWER PATAPSCO AQUIFER 2005 POTENTIOMETRIC SURFACE (Contour interval is 20 feet relative to NGVD29)
0 10 20 MILES
0 10 20 KILOMETERS


PIEDMONT
COASTAL PLAIN
GENERALIZED FALL LINE
Upper Marlboro
Piscataway Cr.
Mattawoman Cr.
Chalk Point Power Plant
Waldorf
La Plata
CHARLES
Zekiah Swamp Run
Nanjemoy Cr.
Prince Frederick
CALVERT
Patuxent River
Calvert Cliffs
ST. MARYS
Leonardtown
Solomons
Naval Air Station Patuxent River
POTOMAC
CHESAPEAKE BAY
RIVER
St. Mary's R.
L. Choptank
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
EXPLANATION
UPPER PATAPSCO AQUIFER 2005 WATER LEVEL WELLS
UPPER PATAPSCO AQUIFER PUMPAGE 2004, in gallons per day
Less than 10,000
10,000 to 100,000
100,000 to 1,000,000
Greater than 1,000,000
UPPER PATAPSCO OUTCROP (Vroblesky and Fleck, 1991)
UPPER PATAPSCO AQUIFER 2005 POTENTIOMETRIC SURFACE (Contour interval is 10 feet relative to NGVD29)



EXPLANATION

- AQUIA AQUIFER 2005 WATER LEVEL WELLS

AQUIA AQUIFER PUMPAGE 2004, in gallons per day

- Less than 10,000
- 10,000 to 100,000 *(no values)*
- 100,000 to 1,000,000
- Greater than 1,000,000

- AQUIA OUTCROP (Vroblesky and Fleck, 1991)
- APPROXIMATE AQUIA AQUIFER BOUNDARY
- AQUIA AQUIFER 2005 POTENTIOMETRIC SURFACE (Contour interval is 10 feet relative to NGVD29; dashed where approximately located)

Well Interference

- Smurfit Stone withdrawals impact much of the entire undesignated region
- Historic pumping from seafood processing and other uses in Colonial Beach, Reedville, Urbanna are likely to have smaller cones of depression that interfere with the Smurfit cone
- Current monitoring is insufficient to characterize the extent

SUPPLY MAY BE OVERDRAWN

Critical Violations
with aquifer test locations

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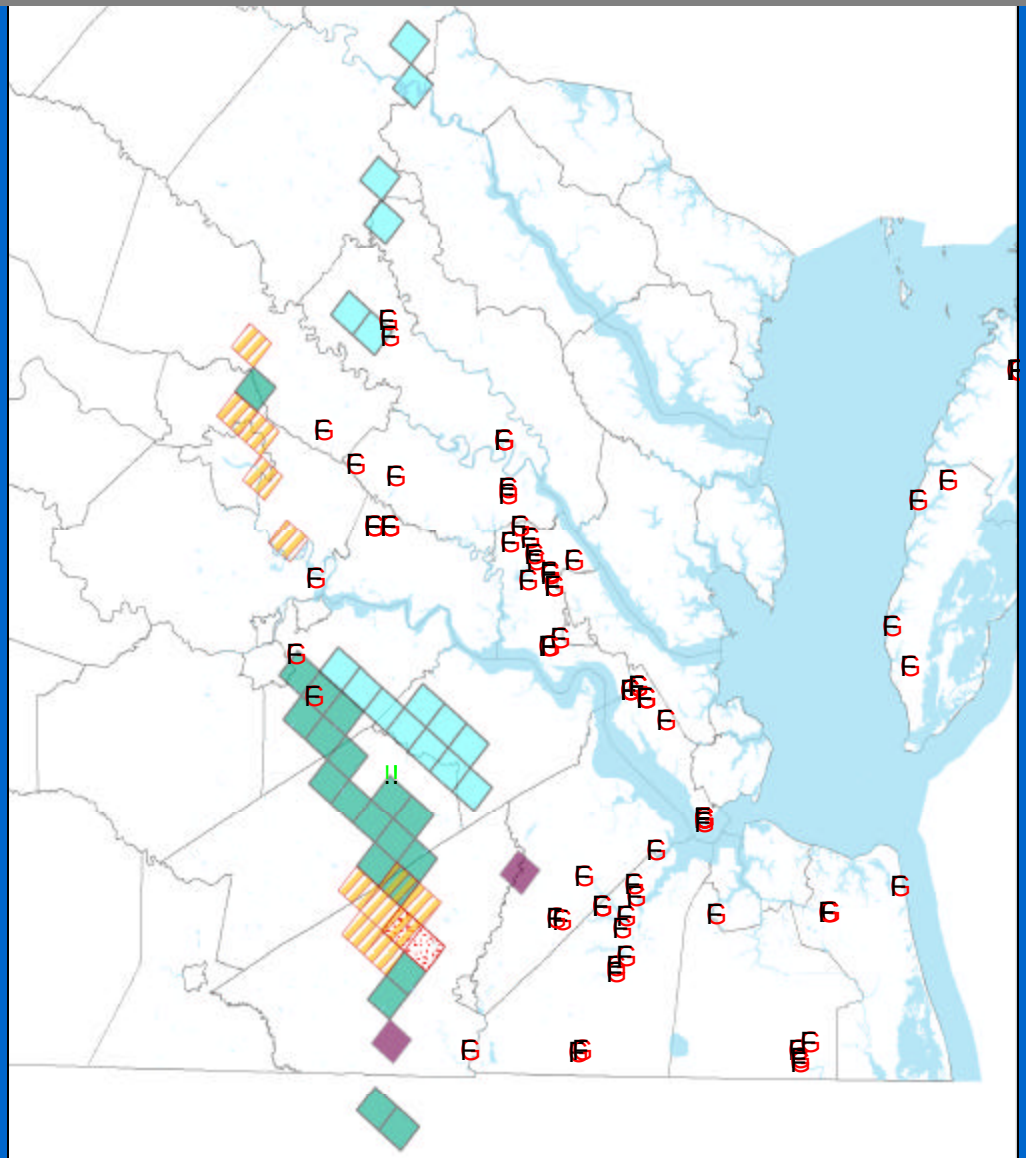

Aquifer Tests
Town of Waverly Wells
Middle Potomac Critical Cells
Upper Potomac Critical Cells
Aquia Aquifer Critical Cells
CPP Critical Cells
Yorktown-Eastover Critical Cells

Miles
0 4.5 9 18 27 36

MAY BECOME POLLUTED

- Southern Lancaster, eastern Middlesex, eastern Gloucester, all Mathews have salt water intrusion issues resulting from proximity to the CB Crater.
- Not enough information at this time in other parts of the area

Chloride Concentrations in Coastal Plain Aquifers